

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 39. (currently amended) A method for early detection of subacute, potentially
2 catastrophic illness in an infant comprising:

- 3 (a) monitoring ~~time-series~~ frequency histograms of RR intervals in the infant;
4 (b) identifying at least one characteristic abnormal pattern or distribution; and
5 (c) correlating the at least one abnormal pattern or distribution with said illness.

1 40. (previously presented) The method of claim 39, wherein the illness is infectious.

1 41. (previously presented) The method of claim 40, wherein antibiotic therapy is
2 initiated and a diagnostic work-up for the illness, comprising obtaining a blood culture from the
3 patient, is provided when the at least one characteristic abnormal pattern or distribution is
4 identified.

1 42. (previously presented) The method of claim 40, wherein the illness is necrotizing
2 enterocolitis.

1 43. (previously presented) The method of claim 42, wherein a diagnostic work-up for
2 the illness, comprising an X-ray of the infant or a pathological specimen from the infant, is
3 provided when the at least one characteristic abnormal pattern or distribution is identified.

1 44. (previously presented) The method of claim 40 wherein the illness is selected from
2 the group consisting of pneumonia, sepsis, and meningitis.

1 45. (previously presented) The method of claim 68, wherein the data set is normalized.

1 46. (previously presented) The method of claim 45, wherein the data set contains on the
2 order of about 10^3 to 10^4 sequential RR intervals.

1 47. (previously presented) The method of claim 45, wherein the at least one
2 characteristic abnormal pattern or distribution is identified based on at least one of the third and
3 higher moments of the data set.

1 48. (previously presented) The method of claim 47, wherein the at least one moment of
2 the data set includes the skewness of the data set.

1 49. (previously presented) The method of claim 48, wherein the illness is sepsis or
2 necrotizing enterocolitis.

1 50. (withdrawn-previously presented) The method of claim 47, wherein the at least one
2 moment of the data set includes the kurtosis of the data set.

1 51. (withdrawn-previously presented) The method of claim 50, wherein the illness is
2 sepsis or necrotizing enterocolitis.

1 52. (previously presented) The method of claim 45, wherein the at least one
2 characteristic abnormal pattern or distribution is identified based on at least one percentile value
3 of the data set.

1 53. (previously presented) The method of claim 52, wherein the at least one percentile
2 value is the 10th percentile value.

1 54. (previously presented) The method of claim 53, wherein the illness is sepsis or
2 necrotizing enterocolitis.

1 55. (previously presented) The method of claim 45, wherein the at least one
2 characteristic abnormal pattern or distribution is identified based on the variance, standard
3 deviation or coefficient of variation of the data set.

1 56. (previously presented) The method of claim 55, wherein the illness is sepsis or
2 necrotizing enterocolitis.

1 57. (previously presented) The method of claim 49, further comprising a diagnostic
2 work-up.

1 58. (withdrawn-previously presented) The method of claim 50, further comprising a
2 diagnostic work-up.

1 59. (previously presented) The method of claim 53, further comprising a diagnostic
2 work-up.

1 60. (previously presented) The method of claim 55, further comprising a diagnostic
2 work-up.

1 61. (previously presented) The method of claim 39, wherein a diagnostic work-up is
2 provided when the at least one characteristic abnormal pattern or distribution is identified.

1 62. (previously presented) The method of claim 39, wherein the infant is a neonate.

1 63. (withdrawn-original) A method for early detection of subacute, potentially
2 catastrophic illness in an infant comprising:

- 3 (a) monitoring the infant's RR intervals;
4 (b) generating a normalized data set of the RR intervals;
5 (c) calculating one or more of (i) moments of the data set selected from the third and
6 higher moments and (ii) percentile values of the data set; and

7 (d) identifying an abnormal hear rate variability associated with the illness based on one
8 or more of the moments and percentile values.

1 64. (withdrawn-currently amended) The method of claim 5363, wherein the moments
2 include the third moment of the data set.

1 65. (withdrawn-previously presented) The method of claim 63, wherein the moments
2 include the fourth moment of the data set.

1 66. (withdrawn-previously presented) The method of claim 63, wherein the percentile
2 values include the 10th data percentile value.

1 67. (withdrawn-currently amended) The method of claim 6467, wherein the infant is a
2 neonate.

1 68. (previously presented) The method of claim 39, wherein the at least one
2 characteristic abnormal pattern or distribution is identified from a data set of RR intervals.

1 69. (currently amended) An apparatus for early detection of subacute, potentially
2 catastrophic infectious illness in a patient, wherein the patient is an infant, a newborn infant, a
3 toddler, or a child, the apparatus comprising:

4 (a) a monitoring device, continuously monitoring ~~time-series~~frequency histograms of
5 RR intervals in the patient; and

6 (b) a microprocessor, identifying at least one characteristic abnormal pattern or
7 distribution in the RR intervals that is associated with the illness.

1 70. (Canceled)

1 71. (previously presented) The apparatus of claim 69, wherein the microprocessor
2 performs the step of generating a normalized data set of RR intervals.

1 72. (previously presented) The apparatus of claim 71, wherein the microprocessor
2 calculates one or more of the third and higher moments of the data set and identifies the
3 characteristic abnormal pattern or distribution based on the one or more moments.

1 73. (previously presented) The apparatus of claim 72, wherein the microprocessor
2 calculates the skewness of the data set and identifies the characteristic abnormal pattern or
3 distribution based on the skewness.

1 74. (withdrawn-previously presented) The apparatus of claim 72, wherein the
2 microprocessor calculates the kurtosis of the data set and identifies the characteristic abnormal
3 pattern or distribution based on the kurtosis.

1 75. (previously presented) The apparatus of claim 71, wherein the microprocessor
2 calculates one or more percentile values of the data set and identifies the characteristic
3 abnormal pattern or distribution based on the one or more percentile values.

1 76. (previously presented) The apparatus of claim 75, wherein the microprocessor
2 calculates the 10th percentile value of the data set and identifies the characteristic abnormal
3 pattern or distribution based on the 10th percentile value.

1 77. (withdrawn-previously presented) An apparatus for early detection of subacute,
2 potentially catastrophic infectious illness in a patient, wherein the patient is selected from the
3 group consisting of a premature newborn infant, infant, newborn infant, toddler and child,
4 comprising (1) a monitoring device, continuously monitoring the patient's RR intervals, and (2)
5 a microprocessor, said microprocessor performing steps comprising:

- 6 (a) generating a normalized data set of the RR intervals;
7 (b) calculating one or more of (i) moments of the data set selected from the third and
8 higher moments and (ii) percentile values of the data set; and
9 (c) identifying an abnormal heart rate variability based on one or more of the moments
10 and the percentile values.

1 78. (withdrawn-original) The apparatus of claim 77, wherein the microprocessor
2 calculates the third moment of the data set.

1 79. (withdrawn-original) The apparatus of claim 77, wherein the microprocessor
2 calculates the fourth moment of the data set.

1 80. (withdrawn-original) The apparatus of claim 77, wherein the microprocessor
2 calculates the 10th percentile of the data set.